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Robust Software Engineering Area
Robust Software Engineering Group

JAVA PATHFINDER CODE DISTRIBUTED OPEN SOURCE

BACKGROUND: Java Pathfinder (JPF) is part of an effort to develop tools and methods to identify and eliminate software errors in NASA's increasingly complex and mission-critical software systems. As an example of this capability, JPF was used to detect inconsistencies in the executive software for the K9 Rover at NASA Ames. Elements of JPF were also used to develop an advanced verification tool for Livingstone 2, which is a model-based diagnosis system currently flying on the EO-1 spacecraft and an example of the kind of autonomy software that will be crucial to future NASA missions. While specific research projects are focused on the verification and validation of NASA software, the recent open source distribution of JPF code enables the broader use and development of JPF capability for other NASA mission uses, and leverages the enthusiasm of the large number of developers in industry who are also working in this area. With open source distribution, all of the good ideas generated by the community can be easily brought back into NASA-relevant work.

Java Pathfinder was originally funded by NASA's IT Base Research program (later the CICT program), with additional funding from the Engineering for Complex Systems Program which re-architected and refined JPF to be a core component of a deployable C++ analysis infrastructure. JPF continues to be a primary research testbed for new automated verification and test algorithms under the Software, Intelligent Systems and Modeling Program.

HIGHLIGHT: Java Pathfinder, a model checker for Java code, is now freely available to developers under the NASA Open Source Agreement (NOSA). The software tests programs by running them through a series of trials to look for conditions under which they will fail. If JPF finds an error in a Java application, the software checker reports the entire process that leads to the bug. JPF is available under the NASA Open Source Agreement, an open source license approved by the non-profit Open Source Initiative. It is available for download on the software development Web site SourceForge.net.

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